
VI. SYNOPSIS OF ANTICIPATED ABATEMENT COST

The spreadsheets included in this report contain a breakdown of the budgetary cost estimates for each material, a total for each area, a subtotal for each building, and finally, a grand total for removal of all asbestos-containing materials and replacement with nonasbestos-containing materials of equivalent or better quality.

The estimated abatement cost is budgetary in nature, since there are many variables which will affect the final construction estimate. Once it has been decided which materials to address, either totally or in a phased fashion, a final estimated construction cost may be determined based on variables such as time frame for construction, type of replacement material chosen, occupancy during abatement, and size of project chosen. All budgetary estimates are based on removal and replacement with nonasbestos-containing materials. This option has been chosen because it usually represents the maximum expenditure, in the short run, that the owner would be making, as opposed to other temporary forms of abatement such as encapsulation or enclosure. Encapsulation is a temporary measure which will seal and, therefore, retard fiber release for only a limited period of time. However, the materials remain in the building and must be monitored periodically as part of an operations and maintenance program. If, however, the study identifies selected areas which we would recommend be encapsulated, enclosed, rewrapped, or otherwise temporarily enclosed, these are so noted in the specific comments and recommendations. There are no standard cost-estimating guidelines that can be used in this report to establish those estimates, since there are numerous variables that affect the final cost.

When attempting to provide a synopsis of the various options available in making an abatement decision, only general options or alternatives can be addressed. There are many combinations of areas and materials which may be addressed in any one abatement project. Historically, most building owners have chosen one of two types of projects:

1. Removal of All Asbestos-Containing Materials and Replacement with Nonasbestos-Containing Materials: This option is the most costly in the short run and may be the most difficult to pursue, considering the possible magnitude of the project, the associated funds which must be appropriated, and the difficulty of moving building occupants to allow for abatement of all materials in one project. However, this option will eliminate the asbestos exposure potential and any problems associated with the presence of asbestos-containing materials.
2. A Phased Abatement Program by Priority: In most cases, the most prudent decision is to remove the asbestos-containing materials on a phased basis, beginning with all of the Priority Level I materials or a combination of the Priority Level I and Priority Level II materials. This option allows the client to expend the first funds on those areas which present the most severe exposure potential. Exposure to any asbestos-containing material which remains is controlled under an operations and maintenance program until those materials can be removed. In many cases, building owners will actually gear a phased abatement program to the priority level, so that Priority Level I materials are slated for removal the first year, Priority Level II materials will be addressed in the second year or second phase, Priority Level III materials in the third year or third phase, and so on.

For budgeting purposes, we have included two cost estimates: one for removal of asbestos-containing materials in *all* priority levels and replacement with nonasbestos-containing materials, and one cost estimate for removal/replacement of *only* Priority Level I materials.

Professional Fees and Other Expenses

In general building construction, the architect's estimate is used as a base figure, with contingency fees added to determine a total project cost figure. Contingency fees include unexpected bid fluctuations, last minute owner-requested change orders, and other changes that may not be anticipated. An asbestos project is no different; therefore, a 5 to 15 percent contingency should be added depending on the size of the project.

VI. SYNOPSIS OF ANTICIPATED ABATEMENT COST

Professional fees must also be considered in the total project scope, since almost all abatement projects today must be designed and managed by a professional engineering or consulting firm specializing in this unique area. The fees for designing the project; developing the plans and specifications; conducting all the necessary prebid and preconstruction conferences; and providing contract administration, supervision and final clearance of the project are usually based either on a percent of the total construction cost (with the percentage dropping as the total cost of construction increases) or on a lump sum or "not to exceed" basis. The professional fees for managing and designing the project and ensuring it is being carried out under stringent, safe conditions could range from 5 to 8 percent for projects over one-quarter of a million dollars in construction estimate, to as high as 10 to 12 percent for much smaller projects. The fees are always exclusive of reimbursable expenses and travel-related costs.

On-site air monitoring and construction supervision is absolutely vital during an asbestos abatement project. Unlike the general construction project in which the architect or engineer checks on the job from time to time, the unregulated nature of the abatement industry requires constant vigilance to ensure that the contractor is complying with all aspects of the specifications, that the procedures are followed to the letter, and that sophisticated monitoring of not only the air inside the work area but also the air outside the work area and inside the building is carried out to be sure that asbestos fiber levels do not exceed safe levels. In addition, the air monitoring records provide the owner with solid information as to the ongoing safety of the project and can be used in a public relations program, since tenants or other building occupants are concerned about the "healthfulness" of their spaces during and after an asbestos abatement project.

The fees for an on-site air monitoring crew and an on-site laboratory for rapid analysis of these critical barrier and final clearance samples are either charged on a per shift basis or as a percent of the total construction cost, depending on the size of the project. They are usually separate from the architectural/engineering fees but may in some instances be combined into one contract with the architectural/engineering portion of the project. Regardless of the abatement alternative chosen, the cost for air monitoring, including construction supervision and management, will be approximately two (2) percentage points higher than the architectural/engineering fees. As a general rule of thumb, it can be estimated that the associated architectural/engineering fees, construction supervision, air monitoring fees, reimbursable expenses, will run approximately 15 to 17 percent of the construction cost for larger projects and could be as high as 20 to 25 percent of the construction cost for smaller projects.

In addition to professional fees during the actual project, there are other fees that may be associated with the asbestos abatement program. These include:

1. The cost of the asbestos assessment survey.
2. The cost to develop and maintain an operations and maintenance program to monitor asbestos-containing materials remaining in the building system.
3. The cost of relocation, in some instances, of employees and other building occupants during asbestos abatement.
4. Down time in productivity for personnel administering the asbestos abatement program.
5. Litigation assistance cost if a cost recovery lawsuit is planned to recover the cost of asbestos abatement from the manufacturers.
6. Other internal costs related to the program.

The following cost estimates give an example of the various expenses based on selected options. Although the first option, removal of all asbestos-containing materials in all Priority Levels and replacement with nonasbestos-containing materials, may not be chosen, a cost estimate is nevertheless supplied to illustrate the cost savings in such a project. The second option covers removal/replacement of only Priority Level I asbestos-containing materials.

COST ESTIMATE

ESTIMATE I: Removal of all asbestos-containing materials in Priority Levels I through IV and replacement with nonasbestos-containing materials.

Total Removal/Replacement	\$1,159,594
10% Contingency	\$115,959
Total Removal/Replacement with Contingency	\$1,275,553

The above total cost with contingency is an estimate of the actual cost once the bids are opened or the project is negotiated with a contractor.

Architectural/Engineering fees for design management, development of specifications and plans, etc.

Estimated at 6.6% of Total Construction Cost:

6.6% X \$1,275,553	\$84,186
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On-site air monitoring and construction supervision during abatement (based on \$490.00 per 8-hour shift per technician)

Estimated at 224 8-hour shifts:

224 X \$490	\$109,760
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Reimbursable out-of-pocket and travel-related expenses

Estimated at 1.0% of Total Construction Cost:

1.0% X \$1,275,553	\$12,756
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Total Project Estimate Including Professional Fees and Contingency

\$1,482,255

VI. SYNOPSIS OF ANTICIPATED ABATEMENT COST

COST ESTIMATE

Estimate II: Removal of all asbestos-containing materials in Priority Level I and replacement with nonasbestos-containing materials.

Total Removal/Replacement	\$800
10% Contingency	\$80
Total Removal/Replacement with Contingency	\$880

The total construction cost for materials in this priority level was too low to justify applying minimum architectural/engineering design, air monitoring, and reimbursable fees; therefore, these costs were not included. These fees will have to be independently negotiated.